Introduction

This topic was originally suggested for an AAAS Symposium by the late Professor Wilbur Franklin of Kent State University, and it was only after his recent untimely death that I agreed to take over as organizer and moderator of the panel. Unfortunately, I was not privy to Professor Franklin's original conception of the subject, nor to his plans for the membership of the panel. From his most recent research activities and articles in the field of psychokinesis, one might assume that he would have focussed fairly explicitly on the direct interaction of human consciousness with physical systems, but that is only my personal suspicion. Thus, the assembly of the panel and the circumscription of the topic had to be my own responsibilities and probably differ from those he envisaged.

My sense of the subject is somewhat broader than that just mentioned. Let me state it via this complex question: As the mind of man pushes inexorably forward with its ever more elaborate and abstract formalisms and its ever more precise and powerful experimental equipment into ever more remote and exotic domains of physical phenomena, may we continue to presume that those phenomena invariably remain passive to our inquiry, simply waiting, as it were, to be labeled and catalogued, or is there the possibility that to some degree, insignificant in many situations, but potentially controlling in others, we may create our own reality in the process of observing it?

nificent accomplishment in the modeling of physical phenomena, are moderately comfortable with such quasi-philosophical dilemmas as the wave-particle dualities, and the "role-of-the-observer" in quantum mechanics, but tend to discount psychic experimentation because of the illusiveness and irreproducibility of the phenomena, the intangibility of some of the parameters, and the difficulties it presents for established formalisms. Yet many of these same physicists have faithfully followed the trail of fundamental particle theory down to such present-day enigmas as "quarks," anti-quarks," and "gluons." Currently touted as the basic ingredient of the physical structure of matter, quarks are now characterized by various permutations of three "colors," five "flavors," and one "charm." Sidney Drell admits, with others, that these are particles which may never be observed, and which might in some sense be compared to poetry, in that they need not "mean, but be"; that one should not ask "what" they are, but "when" they are.[3] In this he is reminiscent of Werner Heisenberg who, shortly before his death, reflected that the question "what do nuclear particles consist of" may be illegitimate, and will happen to yield sensible answers only if those particles can be broken into components by investing energy significantly smaller than their rest mass.[4] Fritjof Capra puts it even more boldly: "Quarks are not particles at all, but events."[5]

Lest all of the suspicion be laid on the quarks, consider their bizarre relatives, the "tachyons." As Jayant Narlikar reminds us, these particles routinely travel faster than light, have an imaginary rest mass, lose energy when increasing speed, can approach infinite velocity, in which condition they have zero energy but finite momentum.[6]

Nor do we need to stay in the sub-nuclear domain to find such difficult conceptions. If we turn our human eyes to the other extreme--to astrophysics, cosmology, and the dynamic universe, and follow our scientific formalisms carefully, albeit courageously, we ultimately encounter similar strains to our comprehension. Most notable is the palpable distortion of our fundamental space/time grid forecast by general relativity theory to derive from intense concentrations of mass.[7] This

distortion reaches its climax in the "black hole," the most powerful of physical entities, characterized only by charge, angular momentum, and, once again, by mass, and for whose interpretation a special "black hole physics" has been propounded.[8]

May we not at least muse that if this space- and time-distorting property we call "mass" ultimately traces down to particles we are forced to experience, rather than to observe, to describe in quasi-poetic terms, to regard as events rather than substance, then we have indeed allowed human consciousness to enter the structure of physical reality?

Indeed, it may not even be necessary to go to these extremes of physical concept to identify participation of subjective perception in the definition of reality. The wave-particle dualities mentioned earlier, whether of electrons or of light, or the Bohr atom with its striking dismissal of classical rationality, also hint at some interjection of consciousness into the physical process. So, too, with the full superstructure of electromagnetic theory, built upon the totally intangible concepts of electric and magnetic fields. Perhaps if we were humble enough, and honest enough, we might even be driven to reopen our dialogue with Newton himself, to question precisely what we do mean by a "force," a "distance," a "time," or a "mass."

Clearly none of these questions, nor any other facets of the subject, are settled by this symposium. It does, however, bring together considerable insight from the domains of basic and applied physical science, and of modern parapsychology--in some cases embodied in the same human consciousness, in others separately. If the multivaried ideas and experiences that are here presented and allowed to reflect off one another do not produce certain conclusions, they unquestionably do illuminate this intriguing topic from divergent points of view. The question is far from answered; but it has now been fairly asked.

References

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2. J. A. Wheeler, "The Universe as Home for Man," American Scientist, 62, November-December, 1974, pp. 683-691.

3. S. D. Drell, "When is a Particle?," Physics Today, 31, June 1978, pp. 23-32.

4. W. Heisenberg, "The Nature of Elementary Particles," Physics Today, 29, March 1976, pp. 32-39.

5. F. Capra, Paper LBL-796, Lawrence Berkeley Laboratories, University of California, Berkeley, Ca., 1978.

6. J. V. Narlikar, "Cosmic Tachyons: an astrophysical approach," American Scientist, 66, September-October, 1978, pp. 587-593.

7. L. L. Smarr and W. H. Press, "Our Elastic Spacetime: Black Holes and Gravitational Waves," American Scientist, 66, January-February, 1978, pp. 72-79.

8. S. W. Hawking, "Black Holes in General Relativity," Communications in Mathematical Physics, 25, 1972, p. 152.

Approved For Release 2000/08/07 : CIA-RDP96-00787R000500380002-6

Chairman's Note:

The formal presentations reproduced above were followed by an animated period of questions, answers, comments and discussion which included many of the audience, as well as the panel members themselves. No attempt will be made here to replicate the details of that discussion, other than to note that it dealt preponderantly with the issue raised by Professor Wheeler in the appendices to his talk concerning the validity of AAAS affiliation for the Parapsychological Association.*

As editor, I have mused for many months what response, if any, should properly be made to that statement in the context of this volume. On the one hand, the issue was clearly tangential, if not irrelevant, to the stated topic of the session, and one could quarrel with the propriety of its original introduction into this forum. On the other hand, once introduced, it dominated the discussion, engendered immediate and substantial coverage in the public press, and was the basis for a number of articles, letters, and responses in various magazines. Several of the panel members, including the chairman, took immediate exception to both the style and factual content of the statement, and their subsequent considered study of it provoked further reservations on their part.

Of the several options: abstaining from further comment on the matter; attempting reproduction of the many elements of rebuttal proferred by the panel members and audience; examining in detail the factual bases of the statement; etc., I have elected simply to reconstruct the spontaneous remarks with which, as chairman, I closed that session. In so doing, it is my hope that further debate on the issue, if any is needed, could be kept in dispassionate perspective and carried forth with the same high professionalism, openness of mind, and humility before valid data that characterize all other aspects of this program, of the Society which sponsored it, and of good science in general.

*Tapes of all presentations and the entire discussion are available from AAAS under the title "Role of Consciousness," (Cassette numbers 79T4891-4893).

Chairman's Summary

In bringing this vigorous discussion to a close, I would like to invoke the chairman's prerogative for a final comment on what clearly has been the most contentious item in the various presentations. I am sure that Professor Wheeler anticipated this when he raised the issue, and that he will not be surprised by my response to it.

In the technical body of his talk, John dealt with an important physical topic in a scholarly and instructive fashion. He focussed on well-defined experiments, interpreted in terms of specific theoretical models, and I for one learned much from his insight. I was less persuaded by the substance and logic of the argument presented in his Appendices. While I fully agree with his criteria for any scientific endeavor, and with his sense of responsibility for the AAAS to protect itself from exploitation and from providing a haven for fraudulent pseudo-scientific work, the case he presented against psychic research was, in its generality and lack of accurate and relevant evidence, much less convincing. To my mind, agglomerating such disparate topics as the Bermuda Triangle, the multi-headed Hydra, some fraudulent work to which friends had been subjected, concerns about inappropriate expenditure of public funds, and the sincere scholarly work of his companions on this panel is not a productive way to address such a difficult issue. If there is a case, it should be developed in terms of specific pieces of work that have been presented to this Society, accurately represented and vigorously contested in the traditional form of responsible, critical dialogue.

Nor can I concur with his recommendation that work such as some of our speakers presented here should be totally relegated to the appropriate specialist societies. As I understand it, the AAAS is not intended as a linear combination of specialist organizations; it does not simply provide an alternative route for specialist presentations. Rather, it is meant to establish a forum for exchange of knowledge and ideas across traditional disciplinary lines, and as such its concern should be more for the clarity, rigor, and interdisciplin-

ary significance of the work presented, than for the heritage of a particular field.

Finally, on his allusion to the cyclical nature of the enthusiasm for, and frustration with, psychic experimentation as indicative of a fundamental invalidity of the field, I would offer the following observation: true scholarly study of such phenomena is barely one century old, and over that period, in comparison with most fields of high science and technology, the resources deployed for this study have been miniscule. Given the complex and elusive character of the phenomena proposed, their immense significance if validated and comprehended, and the recent availability of instrumentation and data processing techniques of sufficient sensitivity to sort out various possible implications, modest but incisive continued effort by sincere and able scholars does not seem to me inherently ignoble.

For my part, I would far rather an organization like AAAS assume some risk of accommodating, in its generosity of scientific spirit, some inconsequential, incorrect, or even fraudulent research, than assume the far more insidious risk of categorically excluding an entire domain of sincere scientific inquiry, regardless of how tawdry its history, or how provocative its subject matter may be. If our concern is indeed for the truth, it is less likely to be found by relegating conscientious investigators to their own provincial hovels than by exposing their work to the open air of just such disciplined discussion as this panel has provided.